

REMARKS

The Application has been carefully reviewed in light of the Office Action dated June 18, 2002 (Paper No. 3). Claims 1 to 19 are in the application, of which Claims 1, 18, and 19 are the independent claims. Claims 1, 18, and 19 have been amended and Claim 20 has been added herein. Reconsideration and further examination are respectfully requested.

Claims 1 to 19 were rejected under 35 U.S.C. § 102(e) over U.S. Patent 6,333,950 (Karasawa).

The present invention is generally related to encoding, multiplexing and outputting of digitized video and audio data.

In a conventional digital transmission apparatus, audio and video data is encoded and packetized into a packetized elementary stream (PES), which is then packetized into a transport stream (TS) and transmitted. However, the data length of a PES packet varies and there is no guarantee that the data length will be an integer multiple of the data length of a TS packet. If the PES packet length is not an integer multiple of the TS packet data length, some of the space in the TS packet is not used, and in fact is filled with throw-away data in order to maintain a uniform packet length for TS packets. A TS packet which includes the throw-away data is then transmitted, which is clearly not a desirable result.

The present invention addresses the foregoing problem and provides a mechanism for improving the efficiency of transmission of encoded data. More particularly, the data length of a first (e.g., PES) data train is controlled in accordance with at least a data length of a second (e.g., TS) data train into which the first data train is

packetized. In so doing, the space in the second data train is more efficiently used, thereby making data transmissions more efficient.

With reference to the specific language of Claim 1, a data processing apparatus is recited, which comprises an input means for inputting data, an encoding means for compression-encoding the input data, a first packetizing means for packetizing the data encoded by the encoding means into a first data train on the basis of a first data length. A control means of the data processing apparatus controls the first data length in accordance with a second data length of a second data train, and a second packetizing means packetizes the first data train into the second data train on the basis of the second data length.

Claim 1 has been amended to even more clearly indicate that the data length of the first data train is controlled by the controlling means based on a second data length of the second data train. Karasawa is not seen to teach or to suggest at least the features of controlling the data length of the first data train in accordance with the data length of the second data train as in Claim 1.

Karasawa is seen to describe multiplexing a PES with a second packet of data such as a program clock reference (PCR) in a TS. This is described in detail beginning at col. 5, lines 67, depicted in Figures 7A and 7B, of Karasawa, and summarized beginning at col. 7, lines 19 to 27 of Karasawa. As summarized by Karasawa, the PCR is added to the TS packet when the variable length PES is such that there is room remaining in the TS packet for the PCR information. The cited portion of Karasawa, namely col. 3, lines 3 to 10, is seen to describe this multiplexing of the PES and PCR information in a TS packet.

Karasawa is not seen to teach or to suggest at least the features of controlling the data length of the first data train in accordance with the data length of the second data train as in Claim 1.

Therefore, for at least the foregoing reasons, Claim 1 is believed to be in condition for allowance. Further, Applicants submit that Claims 18 and 19 are believed to be in condition for allowance for at least the same reasons.

The remaining claims are each dependent from the independent claims discussed above and are therefore believed patentable for the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicant's undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



Attorney for Applicant

Registration No. 39,000

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-2200
Facsimile: (212) 218-2200



APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

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1. (Amended) A data processing apparatus comprising:

a) input means for inputting data;

b) encoding means for compression-encoding the data;

c) first packetizing means for packetizing the data encoded by said encoding

means into a first data train on a basis of a first data length;

d) control means for controlling the first data length of packetizing by said

first packetizing means in accordance with at least a second data length; and

[d)] e) second packetizing means for packetizing the first data train generated by

said first packetizing means into a second data train on a basis of [a] the second data length[; and

e) control means for controlling the first data length used by said first

packetizing means in accordance with the second data length].

time information to the second data train based upon a second period.

18. (Amended) A data processing method comprising the steps of:

inputting data;

compression-encoding the data;

packetizing the encoded data into a first data train on a basis of a first data length;

controlling the first data length of packetizing at said packetizing step in

accordance with in least a second data length; and

packetizing the generated first data train into a second data train on a basis of [a]
the second data length]; and

controlling the first data length at said first packetizing step in accordance with
the second data length].

19. (Amended) A computer readable storage medium storing an image processing program, the program comprising:
- an input step of inputting data;
 - an encoding step of compression-encoding the data;
 - a first packetizing step of packetizing the data encoded [by] in said encoding step into a first data train on a basis of a first data length;
 - a control step of controlling the first data length of packetizing in said first packetizing step inn accordance with at least a second data length; and
 - a second packetizing step of packetizing the first data train generated [by] in said first packetizing step into a second data train on a basis of [a] the second data length]; and
 - a control step of controlling the first data length at said first packetizing step in accordance with the second data length].